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THE FUNCTION OF SCIENCE IN SHAPING PHILOSOPHIC METHOD

PHILOSOPHY is first of all Weltanschauung; it becomes epistemology and metaphysics only by interplay with a gradually segregating body of science. Thus it has come about that in the adoption of its method philosophy has been an imitator. Impulses of thought powerful enough to attain historic dimensions have been in their first intention philosophical; but of the immediate issue whatever has been most readily circumscribable in its domain and formulable in its procedure—the sedimentary portion, in a word, which we comprise under the rubric 'science'—has taken precedence in the estimate of epistemological reflection. Certain prepossessions from this source, those of mathematical method and of the mechanical type of atomism, for instance, we have definitively recovered from; others are still with us. Empiricism and rationalism are both methodic schemes which have been defined in the attainment of scientific self-consciousness; whenever epistemology has made general propaganda of either it is the scientific mind that has been in control.

Philosophy has always to learn from science; but what it has to learn is, briefly stated, itself. If at times, and especially during the last half-century, it has seemed caught like a rear-draught in the wake of the tangibly successful truth-seeker, it is to find itself eventually the impelling wind. The office of science is transitional. It is, nevertheless, an indispensable office, and not alone historically so: apart from a material connection between their methods science could not serve as ferment and bearer of the development of philosophy to the point of self-knowledge. The method of knowledge in general is describable, if at all, in terms of the object of knowledge and of the nature of the knower; whatever is peculiar to the method of philosophy must be determined as a function of the peculiar character of its objects: the dependence of epistemology on Weltanschauung thus provides a clue to estimating the place of science in philosophic knowledge.[1] It is the business of the present paper to trace and define the connection thus outlined.

I. The World as a World of Pure Experience

The thesis that reality, in so far as knowledge can have anything to do with it, is coextensive with experience has been made a cornerstone for epistemologies of widely unlike stamp. If it is claimed as especially harmonious with empiricism it must be on the strength of an assumption that the method of knowledge is not only some function of the object of knowledge, but some function which ties method and object very close together.

The peculiarity of empirical method does not lie in making presentation the prime thing in knowing. Cartesian rationalism does the same: its 'clear and distinct evidence' is *presented* evidence; the observing, even the receptive consciousness, is the fundamental function. The only thing which distinguishes an empiricism such as that of Professor James from rationalism of the Cartesian type is that the former limits the *validity* of every judgment to its psychological career. Summation of experiences within experience is the empiric mode of progression, and summation is ideally never complete: wholes can never be presented. Hence James accurately makes the defining mark of empirical method its procedure from parts to the whole (if there be a whole), and its rejection of the procedure from the whole to the parts. Could we at any time presume to be in actual presence of space as a whole, of the triangle *überhaupt,* of the world in its intrinsic totality, the distinction between empiricism and rationalism would vanish.

What checks the assumption that we *are* at any time in presence of the whole (species triangle, let us say) is only this,—that all thought must be limited by the psychological coefficient of thinking. To the empirical conscience a touch of the inevitable 'here-now' robs of all absolute virtue an 'in presence of'; active knowing must be a process of *spreading,* not one of weaving within a given universal frame. Rationalism errs, therefore, in so far as its process outstrips and distinguishes itself from its material. The empirical domain of knowledge is experience; its process is—experience. The method of knowledge is indeed a function of its object, it is simply the differential of development of that object. Experience as object is *experiencing* momentarily regarded as static and composed; the difference is one of aspect only. In this respect empiricism is always *Identitätsphilosophie.*

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[1] Awareness of the dependence in question is most vigorous in contemporary empiricism despite its vow to be without presuppositions in its theory of knowledge. The reason for this paradoxical position lies in the fact that empiricism is polemic and critical; it is relatively sophisticated; it is a *return* to experience; whereas spontaneous philosophizing is rationalistic. The more radical empiricism becomes, the more visibly does it lean upon its characteristic view of the world.

The motive to this definition is not far to seek. For true as it is that empiricism has in it a strain of freedom which recommends it to the spirit of adventure in philosophy, still deeper in its temper is the note of prudence; it is experience that teaches us to refrain from *a priori* constructions. Our present speculative impotence is the achievement of empirical science in breaking the spirit of philosophy: empirical philosophy erects into a principle the inhibition thus inculcated. We are called back to experience. By whom? By experience itself. The situation is that of a teacher referring to himself as ultimate authority, and this circle is inherent in empiricism. Such a circle is not in itself a discredit; it means only that the view of the world as a world of pure experience is not sufficient to create any presumption in favor of that theory of knowledge.

II. THE WORLD AS A PLURALITY

A pluralistic world, if such were possible, could be taken only empirically. Empirical procedure can indeed do nothing to establish the truth of pluralism, for any evidence must come in the form of contradiction between part and part, or of lawlessness proven in presence of known law, whereas the precedence given by empiricism to the presented particular over the universal makes such conflict impossible: the uncertain universal always yields. But, on the other hand, may not a pluralistic Weltanschauung lend support to empirical method?

Experience as a whole is of all wholes the unattainable *par excellence.* Empiricism may properly speak of 'an' experience and of 'experiences'—but never of 'experience.' Experiences may be comprehensive to any finite degree; experiences of the most various spans and ranges may be woven simultaneously into the mesh of any personal continuum: but each one of them has its limits, be they sharp or vague, constituted by the moment of attention or reflection. Beyond these borders the authority of the insight given in the experience ceases; pretended knowledge of necessity holding good across such borders epiricism resigns, and calls upon all to resign. To the next experience its own world is given anew, and well for habit and action if it turn out to have a structure pragmatically congruous with that of the preceding experience.

The nature of a possible alliance between empiricism and pluralism becomes apparent. If in declaring for pluralism we suppose ourselves to be making assertions about some metaphysical prime mover of experiences different from themselves, we are simply erecting the admittedly fragmentary nature of psychological experience into an assertion of the fragmentary nature of the world, our own imperfectly responsible bearing toward the parts of experience into a proposition of their irresponsible bearing toward one another. But if we adhere to our definition of reality as pure experience, our pluralism is nothing else than a further exposition of our empiricism. It can offer the epistemology no external support, for the epistemology is the source of the Weltanschauung, and of one piece with it.

III. THE WORLD AS FLUENT AND PROLIFIC

Of positive significance for method is a phase of the world whose distinctive value is easily lost sight of in the sweep of pluralism: it is the genuine prodigality of the world, the 'superabundance of life' as different from its 'confusion.' This fertility is not to be described as an assembling, out of the void, of experiences accidentally twinkling into existence, but as a growth and sprouting from the present world as a nucleus, a central hearth and brooding-place.[2] Pluralism legitimately expresses the between of experiences, the moment of segmentation and discontinuity in all transition; but fertility expresses a degree of belonging-together of new and old, a moment of connection in the very material, not alone in the form, of experience.

The prolific world is averse to a world whose character is exhausted in its *subsumedness* under a fixed scheme of premises,—in a word, to the world of the finished system. Now rationalism and system are inseparable. System is not only consummation of rationalism: it is inherent in the procedure. Any bit of knowledge which pretends to have grasped a whole is *in potentia* a closed system with reference to its own defined phase of the world: it is prophetic, even despotic, presuming to govern an infinitude of possible experiences, if not without the consent of the governed, at least in advance of such consent. Along that vista, the whole meaning of the future is exhausted into the present.

The rigidity which empiricism feels in system is largely the claim of this too complete anticipation. The very fluency of experience cries out against it. For as experience has a time-factor, and as this time-factor is determined by the continuous irruption of the unanticipated into the field of consciousness, the system valid for any moment can not be the system closed in any prior moment.

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[2] The pluralist often speaks as if in the growing world enhancements of reality took place beyond the region of those assemblages called minds, and then, as from a distance, associated themselves with these assemblages. The violence thus done to empirical principles is quite gratuitous: in all strict empiricism, mind is the brooding-place of the world within which accessions are constantly developing.

May it be that each moment has its own system? The conscious adoption and prosecution of methods aside, is there any escape from that inveterate disposition bred in the blood of every experience to *be* a system, and a system which touches absolute wholes? To the perspective of empirical psychology the instinct, if we may so speak, by which each experience as it comes places itself under an all-covering sky inherited from its predecessor and to be imposed upon its successor is an unexplained marvel: but if it is real, it is possible; and if it is possible, something about it is necessary.

The solution of the difficulty must lie in determining the sphere within which conflict could possibly occur between a new experience and an established system. It is clear that experience which enters merely as presented material can come into no conflict with the system of the previous moment: it can only displace other material. And likewise, only system can conflict with system. Empirical openness to a range of new experiences (in science or travel, in history or adventure, literal or spiritual) is not an unloading of system to make way for the volume of entering material; it is a mobilizing of system to encourage re-formations within its structure.

The conflict of fact with system from which empiricism argues does not exist. But conflict exists, and how is it to be explained? To feel the resistance of system, a new experience must be itself a system; a fact simply as sensation can answer no question, but it can be raised to the significance of a type; experimental conditions are conditions which endow the particular instance with the power of a whole, and they are conditions defined by and representing an existing system of wholes. Only an existing whole could thus empower a fact; and, on the other hand, *given the existing whole, facts inevitably acquire the force of wholes.* In the presence of system every incoming experience takes on as if by induction the aspect of counter-system. It is evident that an encounter in which the facts derive all their opposing power from the system in which they are to effect changes can not issue in the demolition of system, nor in its discredit. Hence the foe of empiricism in this respect is not rationalism at all, but an energy-factor, the inertia of internal readjustment; and empiricism instead of a theory of knowledge here appears as an ethical principle, demanding energy and agility in reconstructing hypotheses. Here lies the real conflict.

What is of strictly epistemological value in the contention of empiricism is the definition of the laws of encounter between system and experience and the consequent readjustment. They may be briefly put thus:

1. When a system is confronted by new experience the system developed in the new experience stands to the original system in the relation of (1) congruence or (2) incongruence or (3) addition, or two or all of these.

2. In the first case the systems pass to coalescence: the fact is said to be 'understood.'

3. In the second case the first system is altered in part and partly remains unaltered. The alteration takes place upon the principle that the original system must yield to the system of the newly presented fact at whatever cost to itself: this is the fundamental postulate of empiricism. The fact becomes understood by determining the system, the presentation containing an absolutely fixed point. But in order that the new system shall be definitely determined there must be another fixed point, namely, some whole in the original system: this is the fundamental postulate of rationalism.

4. In the third case the original system is not altered, but *further determined.* The new fact as new is not understood, but becomes the ground for understanding further experience. This is the primary process of growth; and as the new acquisition becomes active in understanding more of its own kind, its characteristic wholes and particulars define themselves.

The relation between empiricism and rationalism thus appears in a new light:

1. These two methods historically pitted against one another are both necessary in experience.

2. The relation between them is not one of mere alternation, nor is it a disjunctive relation in such sense that the more of one we employ the less we rely on the other: this is true of the conscious employment of method but not of the actual work of experience.

3. The relation is one of concomitant variation: the two methods are direct functions of one another, so that as the scope of one widens, that of the other must deepen. Our empiricism is a measure of our abundance; our rationalism is a measure of our selfhood in presence of that abundance. For the system of any moment is the 'self' of that moment.

IV. THE WORLD AS SUPRA-RATIONAL AND INFINITE

Current empiricism has not rejected all alliance with system. It has stood only for a democracy of individual experiences, such that unifications in general shall give precedence to facts in general. The gradual extension of system, tightly woven at the level of sensible fact, increasingly unfinished and revisable as the wholes in question become complex, abstract, comprehensive, it inclines to assume as part of its own province. It identifies itself, in brief, with the method of natural science.

The wholes which philosophy is interested in securing for knowledge are precisely those which in the empirical order should be last of attainment, and according to the scale of scientific assurance most hypothetical and liable to revision. But philosophy has attributed to them superior certainty and stability: its special mission is taken to be the establishment of truth both universal and necessary, that is, the determination of wholes which incoming experience can have no tendency to modify. The scientific system is most fixed at the level of physical fact, and increasingly open above; philosophic system is in its nature *closed at the top.*

Such a position opposes empiricism in its last depths. Not system is its ultimate aversion, nor even the pretended knowledge of wholes, but the pretended knowledge of ultimate wholes, assertion of the finishedness of the infinite. Against such pretense it makes the final appeal to its Weltanschauung and exhibits its own final meaning. The whole cult of the given is at heart an assertion of the final impenetrability of existence. Givenness is the darkness, the silence, the inexorableness of what is. In data of wider scope the possibility of solution is excluded by the nature of reason: let reason with its necessities and its symmetries face the irregularities of natural configurations, the chaos and evil in the very world of spirit,—they are incommensurable. Against all fixed optimism, intellectual and moral, empiricism declares the fatuity of assurance: necessity, if there be necessity, has its roots nowhere nearer than in the absolute,—our cleverness has not surprised its secret.

There is more truth and depth in this view of the world than in many a facile monism. But in spite of the truth, there is not lacking a strong presumption that the knowledge of these very ultimate wholes must be within our reach. We have observed that the system of any moment is the self of that moment. It follows that the continuity of system from one moment to another is the measure of our personal identity. If, then, we have any persistent identity throughout the whole series of our experiences, there must be certain wholes, such as space, the physical world, the conscious other, experience itself, which are invariant for knowledge, which, as placers and interpreters of all incoming experience, the course of experience can have no tendency to modify. We are thus driven, as before, to ask what is the precise logical force of that view of the world which empiricism at last depends on.

First of all, to say that an infinitely distant goal is attained by methods having a finite rate is a manifest contradiction. If the rationalism which philosophy practises is identical with the rationalism of natural science, there is an end to the matter. The wholes which natural science projects are admittedly divined, hypothetical, not absolutely known. It is an essential characteristic that they be flexible and replaceable. They are not *knowledge.* And in fact, the chief root of the aversion to system is this: that it adopts the method of hypothesis, and then asserts certainty. It is the note of constructive ingenuity that is more than anything else resented in philosophical system.

Constructive ingenuity, the living spirit of physical method, is even there exotic. The objects which properly invite ingenuity in analysis and ideal reproduction are things which have been ingeniously put together. There is the same propriety in so regarding the physical universe that there is in regarding the circle as a function of chord-structure. Scientific hypotheses are a method of infinite progression toward expressing physical nature in terms of contrivance. From this point of view, anything that can be regarded as a composite, or as a resultant, or as an effect, is open to attack by the constructive imagination of science.

If physical nature is thus only in an accommodated sense open to approach by constructive imagination, how much less the complete nature, the object of philosophy. Whatever savors of inductive cunning in philosophy must fall under distrust. The system of Leibniz, liable as few others to mechanical interpretation, strikingly illustrates how metaphysics fails of inspiring confidence in proportion as its ingenuity excites admiration. Kant himself, exercised more than any other to keep apart the methods of science and transcendentalism, falls into offense when he expresses the latter as inference from the phenomena of knowledge to their necessary conditions, a method suitable only to effects and resultants. In so far, then, empiricism in its rejection of system is in perfect right; the universe is not a composite nor a resultant nor an effect; the rationalism of natural science is out of place in philosophy.

In the second place, empiricism points truly to a certain disparity between the experience-value of any system and the experience-value of any fact. System is related to fact on the one side as infinitude to finitude, for its range is eternity, while that of the fact is the psychological moment; but, on the other side, system stands to fact as finitude to infinitude, for the fact is inexhaustible while system reaches only a limited number of its phases. There is more in any fact of experience than our rationalisms discover, and, on the other hand, we may easily rationalize out of a fact more than it will support. In these truths we have the real ground for the fundamental postulate of empiricism defined in the last section: the adjustment of the infinitude of the universal to the infinitude of the fact is an endless problem, and fact must be the prime mover in bringing about that adjustment. System is inert; it sees beyond itself only by the aid of fact; it grasps wholes, but is unable to finish their definition; it has no internal power either of growth or of correction. It is in the fact, in the infinitude of the not-yet-subsumed, that the *life* of system must lie, and thus the present system must always yield to the system of the incoming fact.[3]

There is nothing here which negates the knowledge of ultimate wholes, and the claim to possess this knowledge seems less preposterous when its infinitude is seen as the mere nucleus and clue of the finite self in presence of unfathomable reality. The positive proof that we have such knowledge, that the discontinuity, the fertility, the very unfathomableness, of the world are known only as held within an experience, so that to every partiality that can be alleged in knowledge there can be shown a prior wholeness, I need not undertake in detail. It is striking that that supra-rational character of the world in which the essential meaning of empiricism is rooted, is a character which is least of all discoverable from an empirical standpoint, since the defining character of the empirical world is that it lies all on the surface.

The result of the argument, constituting a platform for a direct study of philosophic method, may be summarized as follows:

1. Neither scientific empiricism nor scientific rationalism is a position of stable equilibrium in knowledge, and neither can be identified as the method of philosophy. Neither can accomplish, though neither can dispense with, the knowledge of wholes.

2. There is no such thing, strictly speaking, as 'an' experience having limits. In every experience of spatial objects, we are actually *in presence of* the whole of space: there is but one continuous experience of space for any individual life. As the perspective center of any moment is a point from which all of space may be

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[3] As always in empiricism, so here, the ethical mingles with the purely theoretical. The old system, *i. e.*, the accomplished structure of self at any moment, tends to deny the new, not by inherent opposition, but simply by being in possession. It is often willing to think little of the world for the sake of compassing it within the acquired construction, for departure and readjustment require energy. Empiricism holds that it is better to spare energy on the connections and give it to new structure than by a false loyalty to miss the fullness of things,—it is better to have wealth with looseness than unity and poverty therewith: so the sentiment of the proverb is reversed.

reached by continuous variation, space itself being the invariant as perspective changes, so the relation of any other whole to any other particular belonging to it is a presence with the particular by virtue of a differential of continuous variation.

3. The self of any moment of experience is a system of these invariant wholes. Every growth of experience adds to the sum of this possession, so that the body of our *a priori* knowledge is not a static and forever fixed total (as Kant regarded it), but an eternal evolution.

4. These wholes are *given* with experience. Space, the physical world, the world of ideas, the absolute, are quite as *near* in pure experience as the sensation.

5. The work of philosophy is to recognize and define these wholes. Its process is the consummation of empiricism,—empiricism without limit, still more radical,—and of rationalism.

6. For these wholes constitute at once the beginnings and the limits of the infinite series whose construction is the work of science. Both ends of such series must be given, in order that the direction of the series may be determined and the goal identified. As line and curve are both given in this sense, and each may be regarded as the limit of an infinite structure whose elements are of the other, so, for example, are idea and motion both given elements, heterogeneous, in terms of each of which all definable characters of the other may by infinite construction be represented. We may build the framework of our physics from sensations (Mach), or of our psychology from mechanics, outward.

7. None of the wholes is intrinsically more simple than any other.

8. None of them has any superiority as knowledge, or as point of beginning.

9. For neither part nor whole has any inherent knowledge-value. The givenness which is the mark of our passivity in knowledge and of the ultimate darkness of the world to us, is also the mark of *finality* in knowledge; but the given is neither beginning nor end apart from the work of science which fills the field between given and given. Light and penetration exist for us only in so far as we are active; thus both the wholes of philosophy and the particulars of immediate experience derive their knowledge-value from relation to the intermediate scientific structure.

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